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Treatment of irrigation water infested with nematodes using a solar photoreactor (Article)

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Abstract

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The objective of this study was to assess the efficacy of the disinfection of irrigation water loaded with the plant-parasitic nematode Meloidogyne incognita using a solar photoreactor. The photoreactor was comprised of a compound parabolic concentrator and a disinfection chamber made of boro-silicate glass where a static mixer coated or uncoated with TiO_2 was installed. Water loaded with M. incognita was exposed to solar radiation within the reactor and recirculated while accumulated ultraviolet (UV) energy was registered. It was determined that an accumulated UV solar energy of 72 kJ/L inhibited the motility of juveniles while accumulated energy of 215 kJ/L was necessary to inhibit the egg hatching. Plants of lettuce irrigated with the treated water showed significantly less nodulation, higher air-dry weight and root dry-weight compared with the control group. No significant differences were found using the static mixer either coated with TiO_2 or uncoated. © 2020 Desalination Publications.

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Hydroponics | Meloidogyne incognita | Nematode | Solar disinfection

Indexed keywords

Species Index: Lactuca | Meloidogyne incognita | Nematoda

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